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ABSTRACT

The techniques and accompanying problems of collecting data on interventions are explored. As a result of the analyses of two previous studies (Colorado and Kentucky Ethnographic Studies, 1979; and Texas, 1981) a hybrid-method of documenting interventions was developed for use in the Principal-Teacher Interaction Study (PTI). This paper traces the development of the methodology for documenting interventions used in the PTI. Nine elementary school principals (three each from Colorado, Florida and California) served as the primary subjects and informants on intervention in this study. The study sites varied by principal's concerns, year of implementation, and innovation being implemented, as well as by school district. Procedures included: bi-weekly telephone calls, interviews, logging, document collections and field notes by researchers; and multiple perspectives and sources of data. In all three studies, the informants provided data on the interventions in which they themselves, as well as others or events, were the sources of action. The methodology employed for the PTI study is as effective and efficient a self-reporting technique in developing the total picture as are the more expensive ethnographic methodologies. (PN)

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METHODS FOR DOCUMENTING INTERVENTIONS:

STRENGTHS OF A HYBRID MULTI-INFORMANT APPROACH

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METHODS FOR DOCUMENTING INTERVENTIONS: STRENGTHS OF A HYBRID/MULTI-INFORMANT APPROACH[1,2,3]

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For the past five years the CBAM Project at the Research and Development Center for Teacher Education at The University of Texas, Austin, has been developing the concept of "interventions" as it applies to the facilitation of school change. Three studies have been conducted in an attempt to further understanding of this phenomenon and to subsequently develop a theory of intervening. To understand the reasons for and the significance of this research on interventions, it is useful to review a bit of educational history.

Background

National concern about educational effectiveness surged upward in the late 1950's, after Sputnik. Beginning in the 1960's the primary approach to responding to this concern was the "new program" method--develop new programs,

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[1]This paper was presented at the annual meeting of the American Educational Research Association, New York City, March 1982.

[2]Ths research described herein was conducted under contract with the National Institute of Education. The opinions expressed are those of the authors and do not reflect the position or policy of the National Institute of Education, and no endorsement by the National Institute of Education should be inferred.

[3]The authors wish to acknowledge the contributions and participation of their co-workers in this study: Teresa Griffin, Nova Washington, Beulah Newlove, Leslie Huling, Terry Needham, Shirley Hord, Gene Hall and Suzie Stiegelbauer. We also wish to acknowledge the valuable assistance that has been so willingly give by the principals and teachers who participated in the studies.

put them into the schools, and supposedly education will be improved. Millions of dollars were spent by the government and commercial interests in the development, dissemination, and support of literally thousands of these new programs.

However, in the 1970's, evidence began to indicate that in spite of the millions of dollars expended, the "new programs" approach often was not producing the hoped-for outcomes. At this same time, members of the CBAM project staff at the Texas Research and Development Center for Teacher Education initiated research efforts which resulted in the understanding that the key to school improvement is not "new programs," but the individuals within the school: teachers and principals (George & Rutherford, 1977). It is therefore important to know how individual teachers use and feel about new programs or innovations in order to understand how schools change. The CBAM project developed two concepts and assessment techniques -- Stages of Concern (Hall, George & Rutherford, 1979) and Levels of Use (Hall, Loucks, Rutherford & Newlove, 1975) -- which address the question of what teachers do and are concerned about when implementing a new program.

Later, the CBAM project began to focus on those individuals who have responsibility for initiating and supporting school change efforts, the "change facilitators." Just as it is important to understand what teachers do, it is equally important to understand what those who sponsor improvement efforts do to facilitate change. This led to the study of "interventions," defined as those actions or events that influence use of an innovation (Hall, Zigarmi & Hord, 1979). Early studies on interventions done by the CBAM research staff (Hall, 1979; Hall, Hord & Griffin, 1980) and research conducted by others (Little, 1981; Stallings, 1981) revealed that the key change facilitator in school improvement efforts is the school principal. Current

CBAM research, The Principal-Teacher Interaction (PTI) Study, now in the data analysis stage, focuses on interventions made by this key individual.

The study of interventions poses difficult questions and problems for the researcher. First, the researcher is faced with the methodological challenge of devising procedures for collecting and documenting interventions. This is followed by the equally challenging task of analyzing the intervention data. Using the knowledge and experience gained from previous research, the CBAM project staff has developed both a suitable methodology for documenting interventions, as well as a framework for approaching analysis, the Taxonomy of Interventions (Hall, Zigarmi & Hord, 1979).

This paper traces the development of the methodology for documenting interventions used in the PTI Study. Two previous studies conducted which contributed to development of the documentation methodology are discussed. The paper attempts to show how refinement of the concept of interventions and the methods used to research the concept went hand-in-hand. The strengths and limitations of the resultant hybrid/multi-informant methodology are discussed as are implications for use in future research done both within and outside the realm of school change.

Guiding Principles from the Literature

No attempt is made here to provide an extensive review of the literature on the merits of quantitative and qualitative methodologies in research. Rather, what will be presented is literature that has direct application for our research techniques. We do not feel compelled to engage in the controversy over the merits of qualitative versus quantitative methodologies. Although the issue has certainly not been settled, the battlelines are becoming increasingly obscure, and the flag of truce has been raised for those who cannot, or do not wish to choose between the methods. Patton states:

> The issue of selecting methods is no longer one of the dominant paradigm versus the alternative paradigm, of experimental designs with quantitative measurement versus holistic-inductive designs based on qualitative measurement. The debate and competition between paradigms is being replaced by a new paradigm--a paradigm of choices. The paradigm of choices recognizes that different methods are appropriate for different situations (1980, p. 19-20).

Reinhardt and Cook take the position that ". . . qualitative methods need not only to be used to discover which questions are interesting to ask and quantitative procedures need not only be used to answer them. Rather, each procedure can serve each function." (1979, p. 13-14).

Having literature sanction to use one or both methodologies was comforting, but not sufficient to guide our research. Wax (1971) helped to clarify our position in her explanation of four types of researchers; she described one group this way: "They may seek an inside view, but also enjoy working with models. Or they may see themselves as model builders, but enjoy stepping inside a culture or a society in an attempt to understand what the models mean to the people who use them." (p. 45). Through the development of the Taxonomy of Interventions, a tentative model for analyzing interventions had already been developed. The major task in the PTI study was to get an inside view of school principals and the interventions they make, to convert these data into a form suitable for verification against the taxonomy, and to assess the taxonomy against the data.

There was a need to have not only an inside view of the principal and the school, but to have an accurate, reliable view. It was certainly not feasible to have a researcher permanently located in the study schools, so how could we otherwise be assured of an accurate and reliable picture? In his discussion of analyses of social settings, Lofland (1971) offered some useful guidelines for research such as that conducted in the PTI study. He pointed out that in our complex society it is less likely that we will <u>know</u> a people and more

likely that we will only know about a people. To compensate for this difference between knowing and knowing about, he suggests a reasonable substitute for "face-to-face knowing" (p. 3), and characteristics of that substitute. Those who would report on a people should first of all be close to them, meaning both in a social sense and in physical proximity. This closeness should extend over a significant period. Reports flowing from this research relationship should give attention to minute matters and should be truthful and factual. These reports should give ". . . pure description of action, people, activities, and the like" (p. 4). Finally, direct quotations from informants should be used.

Yin (1981) offered some very helpful guidelines for collecting and analyzing case studies. He suggested that sources of information for case studies include face-to-face interviews, telephone interviews, records, documents, and memoranda, illustrative materials (e.g., newsletters), and on-site observations. To help organize information from all these sources, Yin recommended use of a protocol to identify the information desired and the sources from which the information would be gleaned. Furthermore, he recommended that the major informants review the factual portions of case studies after the data are collected. Quantitative tabulations could be applied to data collected in case studies when there are enough studies that could be synthesized across one or a few critical variables. In effect, this constitutes a survey of the case studies (Yin and Heald, 1975; Yin, et al., 1976) and this survey could be subjected to statistical analysis.

The intervention studies done by the CBAM project reflect a blend of qualitative and quantitative considerations as was suggested by Yin, Wax, Lofland and others.

Three Studies Aimed at Documenting and Understanding Interventions

The CBAM Project has conducted three studies in which interventions were identified and documented. These studies demonstrate the developmental progression of the project's conceptualization of interventions as well as the refinement in methods of documenting and analyzing interventions. All studies employed qualitative "descriptive but not yet quantified (Meyers, 1981, p. 161)" procedures for collecting intervention data. However, documenting procedures became somewhat more structured as the defining characteristics of interventions evolved.

Study 1 (A and B): Colorado/Kentucky Ethnographic Study

The first study to be discussed is actually two studies which were conducted concurrently at two different sites, but which encompassed many of the same aims, purposes and methodologies. In both studies, the aim was to collect descriptions of actions or events which might potentially affect implementation of the innovation being studied. In one of the studies (1A), attention was focused at the district level, and in the other (1B) the focus was on an individual school. Ethnographers were employed at each of the two sites. The ethnographers were given the project's working definition of an intervention to guide their data collection, but were given very little structure otherwise.

The first of the two studies took place in a large suburban school district in Colorado and focused on the implementation of a district-wide revision of a science program for grades 3-6. One aspect of this effort involved the documentation of what was done by district staff developers and the science department staff to facilitate implementation of the revised science program.

In order to accomplish this task, the following procedures were employed:

1. A full-time ethnographer, located on-site at the district office, was employed during the first two years of the implementation effort. This individual described the activities of district administrators, staff development and science department staff, as well as science teachers and other teachers who served as change facilitators in the implementation effort. The ethnographer's field notes for the two years resulted in 41 volumes (approximately 3,000 pages) of intervention and contextual descriptions.

2. Several of the district staff members kept records on their activities as participant observers.

3. The CBAM Project staff kept notes of their own activities which had potential for affecting implementation when they were on-site for purposes of planning and quantitative data collection (another aspect of the study).

4. District memoranda and other documents related to the science program implementation, including newspaper reports, were also collected to add to this qualitative data base.

Simultaneously with this study of a science program implementation in Colorado, the CBAM project also monitored the implementation of Reality Therapy as a new approach to discip ine at a junior high school in Kentucky (Zigarmi, 1979). This innovation was one part of a Teacher Corps project developed and implemented through the collaboration between the junior high school and a nearby university. The main focus of this effort was to study actions taken by school, school district and university personnel to facilitate the implementation of the new discipline strategy.

An ethnographer was employed to document actions or events occurring which might have some influence on implementation. The ethnographer was on-site for two days a week during the first year of implementation and two to three days a month during the second year. The ethnographer observed

university change facilitators meetings with the principal, teaching teams and individuals, the principal's meetings with teachers, as well as workshops and weekly faculty meetings. She also conducted frequent informal interviews with change facilitators and project staff, university faculty members, the principal, the team leaders and individual teachers. When away from the site, the ethnographer maintained contact with a few significant individuals by phone. She also had access to meeting minutes, key district documents like school policies, and media reports. All of these information sources resulted in 30 volumes (approximately 2,000 pages) of descriptive narrative on the two-year implementation effort.

During the two years that studies 1A and B were proceeding, the CBAM project conducted monthly meetings of the staff, including both ethnographers at the project office in Texas for the purpose of clarifying the concept of interventions and developing a "taxonomy" of interventions. Work towards this goal continued for another year following completion of the field work and resulted in the development of two frameworks for analyzing interventions: Levels of Interventions which describes a hierarchy of intervention types from incident to tactics and strategies, up to policy interventions (Hall, Zigarmi, & Hord, 1979) and a coding schema for specifying the subparts of interventions, such as the source, target and function (Hord, Hall & Zigarmi, 1980).

The Colorado/Kentucky study not only contributed to our understanding of the concept of interventions and ethnographic methodology, but also made apparent the importance of the role of the principal in school change efforts. Current literature on the role of the principal (e.g., Little, 1981; Stallings, 1981), also supports this view. A decision was made to focus

future research by the CBAM project upon interventions made by the school principal to facilitate the implementation of innovations.

Study 2: The Pilot Study

In preparation for the major research study on the role of the principal in school change, the CBAM Project conducted a 3-month pilot study in ten schools in Central Texas (Griffin, Goldstein & Hall, 1981). The main purpose of this pilot study was to investigate different ways of collecting information about interventions made by school principals as they are facilitating implementation of innovations in their schools.

Since the project had gained some experience with the use of ethnographic techniques in earlier studies, and since the conceptualization of interventions had evolved considerably, it was decided that various forms of structured self-report would be tested in this pilot. The ten schools that participated in the pilot were involved in the implementation of different innovations and were at different phases of the implementation process. Two principals were assigned to each of five self-report procedures.

Before the study began, members of the CBAM research team conducted individual sessions with each of the principals to acquaint them with the project's definition and conceptualization of interventions and to train them to identify and describe interventions made by themselves and others. Regardless of the procedure group to which they were assigned, each principal was trained and asked to describe interventions in terms of :

1. What the action was
2. Why the action was taken
3. To whom the action was targeted
4. When the action occurred
5. How long it took to complete, and

6. What the perceived effects of the action were.

The five variations of self-reporting procedures tested were as follows.

1. A written log maintained on a weekly basis by the principal. Principals described each of their own and other facilitators' interventions by recording them on logging sheets (Figure 1), including information on the six categories mentioned above. Principals were asked to mail their logs to the project office each week.

2. A weekly report submitted via audio tape. The procedure for this method was basically the same as for the written log, except that principals in this group tape-recorded their information in place of writing it down. They used the same six informational categories as did those completing the written log. They were asked to mail their tapes to the project office weekly. A project staff member later filled out log sheets based on the information on the tapes.

3. Weekly reports provided via telephone. Project members contacted principals by telephone once a week in order to obtain descriptions of interventions made by the principal and others the previous week. The project member probed for more information about actions mentioned by the principal, when necessary, to obtain complete data. These conversations were tape-recorded and later transferred to logging sheets by the project staff member.

4 & 5. Face-to-face interviews with principals--two variations. Once a month a project staff member visited the school and interviewed the principal about interventions that had occurred during the last month. Two forms of structured interviews were used--one based on the concept of game plan components, which is one of the Levels of Interventions (Hall, Zigarmi & Hord,

PRINCIPAL LOG Figure 1 Name _____ IDP 2

Week of _____, 19 ____

Coding for R&D Use	Date	Target(s)	Actions Taken: What Did You Do?	Intent: Why Did You Do It?	How Long Did Your Action Take?	What were the Effects?
	13					14

Mail your log(s) each week to the UTR&D Center in the envelopes we have provided.

1979), and one based on the concept of Stages of Concern (Hall, George & Rutherford, 1979). The interviewer probed to obtain complete information on the six components for each intervention mentioned. The interviews were recorded and project staff members later transferred the intervention data to logging sheets.

At the conclusion of the pilot study, three teachers from 5 of the sample schools (15 teachers total) were interviewed to determine whether they could recall and verify the interventions reported by the principals. These teachers were asked a general question about actions or occurrences which might have influenced their use of the innovation and then they were asked questions directed at determining if they could verify specific interventions which had been reported by their principal.

Finally, at the study's conclusion, each principal was interviewed by a project staff member to determine his/her reaction to participation in the study. In addition to general reactions to the study, the debriefing included questions about reactions to the specific procedures tested, problems caused by the procedures, and whether or not and how involvement in the study affected actions taken with respect to the innnovation.

The pilot study data were analyzed to determine the effectiveness and efficiency of the various documentation methods in order to select the procedure to be used in the major study on principal interventions (the Principal-Teacher Interaction Study). Several aspects of effectiveness and efficiency were considered in the analysis: level of compliance of principals with the procedures; sufficiency, completeness and appropriateness of the data; whether the method yielded "bonus" (e.g., contextual) data; agreement

between the principal's self-report and the teacher's verifications; the satisfaction and comfort of both researchers and subjects with the collection procedures and, finally, cost-efficiency (results are reported in Griffin, Goldstein & Hall, 1981). As a result of these analyses, a hybrid-method of documenting interventions was developed for use in the Principal-Teacher Interaction Study.

Study 3: The Principal-Teacher Interaction Study (PTI)

The Principal-Teacher Interaction Study focused specifically upon school principals to determine what they do to aid the implementation of new programs in their schools. Three major questions guided this study: (1) What do principals do as change facilitators?, (2) How do the concerns of principals effect their functioning as change facilitators? and (3) What is the relationship between administrator concerns, the interventions they make and their effects on teachers?

Nine elementary school principals served as the primary subjects and informants on interventions in this study. Three principals were selected from school districts in Colorado, Florida and California. The principals were chosen by district administrators to represent change facilitators with varying kinds of concerns--impact concerns, task concerns and personal concerns. Each of the three school districts were at different points in the process of implementing a district-wide innovation. The California school district was beginning its first year of implementation of a new composition writing program; the Florida district was beginning its second year of implementation of a unified math curriculum; and the Colorado district was into its third year of implementation of a revised science curriculum. So, the study sites varied by principal's concerns, year of implementation, innovation being implemented, as well as by school district.

As in the pilot study, principals were trained on an individual basis to identify and describe interventions made by themselves and others. By this point in time, the CBAM project's conceptualization of interventions was quite well defined. As mentioned previously, concept development culminated in a taxonomy and framework which enabled the researcher to code individual interventions on a number of dimensions (Hord, Hall, & Zigarmi, 1980): level, sublevel, source, target, function, medium, flow and location. In these sessions, principals were trained to provide sufficient information in reporting interventions to allow for coding on these dimensions. At the end of the training sessions, the principals were left with training notebooks which contained intervention and dimension definitions and examples. They were also provided with specially-designed calendars which had notations on important dates in the study and ample space for intervention notes.

Study Procedures

The procedures developed for documenting interventions in the PTI study combined the most successful elements of procedures tried in the pilot and in earlier research. The procedures included bi-weekly telephone calls, on-site interviews, informal logging, document collection and field note-taking by researchers. The study also included multiple perspectives and sources of data. Though the principal was the focus of the study, others, such as teachers, assistant principals and district resource personnel, also served as informants on interventions. A summary and time-line of these procedures, which are described in more detail below, is provided in Figure 2.

Members of the CBAM research team contacted study principals (and assistant principals) by telephone on a bi-weekly basis during the 1980-81 school year to collect data on interventions related to the innovations being studied. The researcher began each call by asking the principal what actions

he/she had taken with respect to the innovation during the last two weeks. Then the principal was asked about other actions or events that had occurred which might have some effect on the implementation. As the principal reported each intervention, the interviewers would probe for all the information necessary for coding and for understanding the action and its effects. To facilitate this process, principals were asked to keep notes on the calendars provided by the project during the two week interval between phone calls.

Face-to-face interviews were conducted with principals (and assistant principals) on-site three or four times during the study period. These interviews focused on obtaining higher level interventions, like game plans or strategies, as well as background, philosophy and contextual information. Teachers also were interviewed during these on-site visits. They were asked open-ended questions about interventions which had occurred, as well as specific questions pertaining to interventions which had been reported by the principal (or assistant principal).

District level resource personnel who acted as change facilitators for the innovation served as additional informants on interventions. They were questioned about their own interventions at the study site schools, as well as interventions that they knew others had performed in these schools. Interviews were conducted by telephone or on-site on a semi-regular basis --from once a month to once every three months. These interviews proceeded in much the same way as the principal interviews.

CBAM project staff members also served as sources of intervention data. The staff members noted interventions they themselves had made, as well as interventions they had observed while on site at the schools.

Figure 2

PTI Data Collection Procedures and Timeline

Principals (and Assistant Principals)	May 1980	Oct. 1980	Jan. 1981	May 1981
Intervention phone interviews		bi-weekly		
Intervention face-to-face interviews	X	X	X	X
Field note-taking	X	X	X	X
Context survey			X	
Change facilitator Stages of Concern Questionnaire	X	X	X	X
Teachers				
Intervention face-to-face interviews	X	X	X	X
Stages of Concern questionnaire	X	X	X	X
Levels of Use interview	X	X		X
Innovation Configuration interview	X	X		X
School Climate Survey			X	
District Personnel				
Intervention phone interviews		intermittent		
Intervention face-to-face interviews	X	X	X	X
Context Survey			X	

Data on a number of variables other than interventions were also collected as part of the study:

1. Variables which were used as indicators of the effects of interventions on teachers -- teachers' concerns about and use of the innovation, measured by the Stages of Concern Questionnaire (Hall, George & Rutherford, 1979) and the Levels of Use (Loucks, Newlove & Hall, 1976) and Configurations Interview (Heck, Stiegelbauer, Hall & Loucks, 1981).

2. Principal (and assistant principal) concerns about facilitating the implementation of the innovation, measured by the Change Facilitator Stages of Concern Questionnaire (Rutherford, Hall & George, 1982).

3. School and district contextual variables. The work of James and Jones (1974, 1979) influenced the CBAM project's conceptualization of this set of variables. Project members collected information on the more objective-type characteristics of the school and districts, as well as data on school climate as perceived by teachers (Hall & Griffin, 1982).

In addition to the structured data collection procedures, research staff kept ethnographic notes on their visits to the schools, as well as notes on their impressions, hunches and possible hypotheses about principal behavior. The project staff also kept up with school district news and subscribed to local newspapers in each district to monitor any external events that might affect innovation implementation.

Summary of Methods of Documenting Interventions

Figure 3 organizes documenting methods employed in the three studies discussed above according to two dimensions: (1) the informants or sources supplying information about interventions, and (2) the procedures by which the

informants provided the data to the research project. In all three studies, the informants provided data on interventions in which they themselves were the source of the action, as well as interventions in which others or events were the sources. In Studies 2 and 3, a large proportion of the interventions had the principals as source because the principal's behavior was the focus of the study and because the principal served as the primary informant in these studies. In these studies, the other informants -- teachers, external change facilitators, and the researchers -- reported on the principal's actions as well as actions they themselves and others had taken which might have affected implementation of the targeted innovations. As far as the procedures were concerned, while observation and document review played a role in the studies, the majority of procedures employed and tested were different forms of self-report.

Another dimension which varied across the studies, and which might have been added to Figure 2, is the intensity or frequency of the data collection methods. In Studies 1A and 1B the data collection was continuous or close to continuous, involving a full-time ethnographer at one research site (Study 1A) and a part-time ethnographer at the other (Study 1B). In Studies 2 and 3, documentation procedures were more intermittent: the telephone procedures involved contact on a weekly or bi-weekly basis and the on-site interviews involved contact 3 or 4 times during the study period. Frequency of contact is emphasized because it is one variable which was found to be an important determinant of a documenting procedure's effectiveness.

Figure 3

A Summary Table of Methods of Documenting Interventions

Data Collection Procedures

Informants	Observation	Oral Reports: Face-to-Face	Oral Reports: Telephone	Oral Reports: Tape	Written Reports
Principal/AP		Study 1 Study 2 Study 3	Study 1 Study 2 Study 3	Study 2	Study 2 Study 3 (minimal)
Teachers		Study 1 Study 2 Study 3			
External Change Facilitators		Study 1 Study 3	Study 3		Study 1
Outsiders (District Adm., news media)		Study 1 (minimal)			Study 1 Study 3
Researchers	Study 1 Study 2 (minimal) Study 3 (minimal)				

Study 1: Colorado/Kentucky Ethnographic Study

Study 2: Pilot Study

Study 3: Principal-Teacher Interaction Study

NOTE: each informant provided data on themselves and on all other informants.

Strengths and Weaknesses of the Various Procedures for Documenting Interventions

The following discussion of the strengths and weaknesses of procedures used by the CBAM project for documenting interventions will be based upon data collected in the pilot study (Study 2), debriefings with principals done at the conclusion of Studies 2 and 3, and the personal impressions of the research team (e.g., Hall, 1980; Hord, 1980). Judgements of strength and weakness will focus on a number of criteria that have been deemed important to the study of interventions as well as to research, in general: cooperation/compliance with the research effort, codability and completeness of the data set, representativeness and range of interventions, expense and ease of the procedures, degree to which the procedures intervene upon behavior of participants or interrupt normal routine, degree to which they offer an understanding of the total context, and amount of data reduction required for analysis.

Ethnographic Observation

When observation is a continuous or semi-continuous data collection activity, it has the unique advantage of providing the most complete information on interventions. The researcher has the opportunity to record small, seemingly insignificant incidents that might have gone unmentioned in an interview or written log. The researcher can record elements of the action or event that are necessary for coding, as well as descriptive notes to explain the context and links between interventions. This offers the potential of grasping the dynamics of the whole implementation effort. Observation also avoids the pitfall of subjects' social desirability bias -- the desire to be seen in a positive light -- that is a shortcoming in self-report techniques.

On the other hand, observation without the addition of self-report, restricts the picture to the researcher's point of view. It does not allow the subject the opportunity to explain actions in terms of emotional or cognitive motivations and effects -- the researcher can only infer these dimensions based on behaviors. Ethnography also presents the problem of "co-optation" of the observer (Hall, 1980). Field site personnel often place pressures on the ethnographer to become involved in activities, like consultation, that can bias his/her role as an impartial observer. Since the ethnographer cannot be at all places at one time, the process of selecting areas upon which to focus attention can also create a biased picture.

Being observed often causes subjects a certain amount of discomfort or stress, especially at the beginning of the study or during "sensitive" situations (Hord, 1980). Potentially, the presence of an ethnographer can consciously or unconsiously alter the normal behavior of the subject. . This tendency would probably be more pronounced in discontinuous or short-term data collection procedures in which the subject has not become accustomed to the observer's presence. Finally, ethnographic observation culminates in massive amounts of descriptive information that must then be reduced for analysis. This data reduction process tends to be quite costly in terms of staff time, as does the data collection phase of ethnography.

Face-to-Face Interviews

Face-to-face interviews tend to be a comfortable, easy method of data collection for study subjects, as well as for researchers. Unlike pure observation, the interviews give the researcher the opportunity to probe for clarifying or explanatory information and for data needed to code interventions properly. If face-to-face interviews are done fairly frequently (every two weeks or so) they can provide enough information to build a fairly

complete picture of the implementation effort. If the interviews occur at the study site, they also allow the researcher to collect contextual data through observation.

However, unless the interviews take place very frequently, which can be very costly if travel is involved, a certain amount of information is likely to be lost due to memory limitations. Subjects are most likely to remember interventions which have taken place closest to the time of the interview ("recency" effect). There will also be a loss of data on interventions that the respondent fails to see as important to the research effort. This loss of seemingly insignificant data can well be a limitation of any self-report method. The tendency of the subjects to present themselves in a positive light is also an inherent limitation of interviews and other forms of self-report. Face-to-face interviews also tend to generate large amounts of descriptive data which must then be reduced or summarized in some fashion for data analysis.

Telephone Interviews

Telephone interviews are characterized by most of the same strengths and weaknesses as face-to-face interviews. However, since they generally involve less cost, they can usually take place more frequently. With the increase in frequency of contact, comes the ability to capture more of the incidental interventions that may be forgotten during longer intervals. Telephone interviews also tend to be less disrupting to school routine and therefore more acceptable to research subjects if they are to take place on a regular basis.

Telephone interviews without previous face-to-face contact, however, engender a certain degree of discomfort on the part of both the interviewer and the respondent. Some subjects in the pilot study said that they would not

like to do telephone interviews with someone they had never seen. It also takes a longer time to build trust and openness within a faceless relationship. On the other hand, with some respondents, the anonymity might increase honesty and openness, decreasing the desire to present oneself in a purely positive light. The lack of non-verbal cues can, in some cases, limit the interpretation of verbal reports. However, this did not appear to be a significant problem in any of the studies reported here.

Tape-Recorded Reports

Tape-recorded reports of interventions provide the advantage of immediacy -- they allow the subject to report on actions shortly after they occur. If used as intended, tape-recorded reports would decrease the loss of information due to memory failure. It is also a very inexpensive method of data collection involving little staff time or travel expenditure. Tape-recorded reports also tend to include more descriptive information and anecdote than written logs, since writing is often viewed as a burden.

Contrary to expectations, a few of the subjects in the pilot study (Study 2) felt uncomfortable about, or intimidated by, tape-recording. This technique therefore resulted in a lower degree of cooperation or compliance with the study procedures in the pilot than did techniques involving researcher/subject contact. Another disadvantage of this technique is that it does not allow the researcher to probe for additional or clarifying information. This sometimes results in incomplete or incomprehensible data for coding and subsequent quantitative analysis. Lack of non-verbal cues can also be a limitation; but, tape-recording does provide access to tonal quality of the voice in interpreting interviews, which the final procedure to be discussed, written logs, does not.

Written Reports

Having the subject keep written reports or logs is probably the least expensive form of data collection on interventions. Like tape recording, it also has the advantage of immediacy; the subject can jot down notes when something occurs. This would result in a more detailed, complete picture of the change effort. Written logs also involve considerably less data reduction for analysis than do the other methods discussed.

The main problem with written reports is the subjects' reluctance to comply. Writing appears to be more demanding, or more of a burden, than the other forms of data collection, even if it does not really involve the expenditure of more time. Like tape-recording, it does not allow for researcher probing or clarification. Also, like the tape-recording technique, the focus is on the small, incidental events. When the focus is at this level, one never does get a sense of the whole picture from the subject's point of view. The researcher often must infer or deduce the higher levels of interventions, such as strategies and game plans, him/herself. Links between interventions which clarify the flow of events are often missing.

Figure 4 serves as a summary of the strengths and weaknesses of the various procedures for intervention documentation just discussed. It would appear that some combination of procedures would result in elimination of several of the weaknesses and enhancement of the strengths of any one technique . The CBAM staff found this to be true in the PTI study (Study 3) in which most of the procedures discussed were employed in varying degrees.

Strengths and Limitations of a Hybrid/Multi-Informant Method of Documenting Interventions: The PTI Study

The procedures used to document interventions in the PTI study (Study 3) included both face-to-face and telephone interviewing, some ethnographic

Figure 4

Strengths and Weaknesses of Procedures for Documenting Interventions

	Observation	Face-to-Face Interviews	Telephone Interviews	Tape-Recorded Reports	Written Repports
STRENGTHS	Gives total picture Complete codable data set Avoids subject "social desirability" bias Provides contextual information	Comfortable/easy for researchers & subjects Clear/codable data set Fairly complete picture Some contextual information	Easy for researchers and subjects Clear/codable data Fairly complete picture Less costly than observation and face-to-face interviews Avoids much loss of information due to memory limitations	Immediacy--can capture events shortly after happening Inexpensive Often includes more descriptive information than written reports.	Inexpensive Less data reduction Immediacy
WEAKNESSES	Researcher bias Co-optation of observer-loss of objectivity Discomfort/stress to subjects Potentially disruptive to normal behavior/ routine Expensive Requires much data reduction	Loss of data due to memory limitations Loss of seemingly insignificant incidents Subject "social desirability" bias Requires data reduction	Potentially uncomfortable for subjects & researchers (initially) Takes longer to build trust/openness Lacks non-verbal cues Subject "social desirability" bias Requires much data reduction	Uncomfortable for some subjects Doesn't allow for probing by researcher (less complete/clear data) Lacks non-verbal cues Focus is at incidental level--must deduce higher levels	Subject reluctance to comply Focus is at incident level--must deduce higher levels Lacks non-verbal cues (and voice tone cues)

observation and some written documentation. Information was gathered from a number of informants at each site. Data collection also proceeded for one full school year. The combined methodologies, as well as the intensity and length of the investigation, acted to negate many of the weaknesses of more limited, single-method studies.

The combined procedures resulted in codable data that fairly represented the implementation processes at all nine study sites. In the study debriefings, all principals felt that we had gotten a fair representation of the actions and events related to the innovation that had occurred at their schools. Some principals went so far as to say that we had "gotten it all" or 98% of all that had happened regarding the innovation that year. They said that we might have gotten more details if we had been at the site more frequently, but that we would not have gotten a different picture.

The principals were hinting at the notion of "diminishing returns". If pure ethnographic procedures had been used, it is possible that we would have collected more incidental interventions. But the cost in moving from 90% complete data to 99% would have been high, in terms of dollars and staff time, and probably would have gotten us very few additional significant interventions. Details and links might have been filled in, but the total picture is not likely to have changed. The techniques employed resulted in a picture which included the large plans and events, as well as a flavor for the every day occurrences.

All of the principals reported that they felt comfortable with the procedures, and most expressed the feeling that they had enjoyed participating because it had given them the opportunity to reflect on their behaviors. The procedures, and the study as a whole, increased awareness of what and how much they were doing to facilitiate implementation of a new program. The procedures

were not perceived as a burden or a disruption to routine. Only one of the principals mentioned a problem, and that had to do with finding space where the interviews with teachers might take place. Some of the teachers felt a bit "imposed upon" at the beginning of the study, but once they became more familiar with the researchers and with the purpose of the study, this was no longer a problem.

One of the main contributing factors to the success of the techniques used in the Principal-Teacher Interaction study was continuity in contact with the school. One researcher was assigned to each of the schools. This one person was then responsible for all data collection, follow-up, and feedback involving that site. This enabled the researcher to build a total picture of what was going on in that school. Two of the principals mentioned that they were amazed at how much the researcher remembered about what had happened earlier in the year. One principal said he thought the researcher may have had a better overall understanding of what was happening than he did. The assignment of one liaison to each site also enabled the development of trust and rapport between researcher and subjects which probably resulted in increased openness and more complete and valid data.

The inclusion of multiple respondents or informants for each study site was a very significant strength of this study. To begin with, having more than one informant per site resulted in a larger, more complete data set than would have been possible with just one informant. Though the additional subjects or informants -- the assistant principals, teachers and district resource people -- reported many of the same interventions as the principals, they also reported quite a few different ones.

Having multiple reports on the same intervention also has advantages. It provides an opportunity to assess the degree of bias and accuracy of the data

obtained by self-report procedures. Basic descriptions of the same action or event reported by different individuals tended to be quite similar. The pilot study, in which principals and teachers reported on the principal's interventions, also revealed a high degree of verification of principal self-reports. Often one person can fill in details that the other person has forgotten. Different informants can also provide different viewpoints on effects of interventions.

Despite the fact that the hybrid/multi-informant methodology overcomes many of the weaknesses of individual methods, a few limitations persist. As in any self-report procedure, the tendency to present oneself in the best light ("halo effect") still exists in the hybrid procedure. This tendency reveals itself during intervention coding, such as when trying to determine who was the source of an action. Some principals would give the impression that they had initiated an action when it was actually the "so-called" target who was the initiator. It is often possible to ferret out these biases and determine what actually happened when more than one individual reports on the action. However, many interventions were only reported by one source.

Another limitation of the multi-method approach of the PTI study is its dependency on the skills and talents of the researcher. The researcher must possess good interpersonal skills, as well as a thorough understanding of the research questions and objectives, to obtain complete and trustworthy data. In projects like the PTI study, in which different researchers are responsible for each study site, it is necessary to have highly specified procedures, intensive researcher training and ongoing communication between researchers in order to make valid cross-site comparisons.

Finally, the most serious limitation of the procedures used in the PTI study is the intervening effect of the research upon the study subjects' usual

behavior. Almost all of the principals said that participation in the study increased their awareness of their own actions pertaining to the innovation. Several of them admitted that their involvement in the study may well have caused them to act differently -- to intervene more -- than they would have otherwise. In the words of one principal, involvement in the research "put a little extra push behind me." This increase in innovation-related behavior could mean that the PTI Study descriptions of principals as change facilitators are somewhat optimistic. A few of the principals felt that study participation may have affected their teachers also, causing them to place a higher priority on the innovation than they might have otherwise. It is possible that a participant observer who has assimilated him/herself into the context might be able to circumvent this intervening effect. On the other hand, it also may be impossible to control for this effect with any procedure which can be used to document interventions.

Summary, Conclusions and Implications

The paper has explored the techniques and accompanying problems of collecting data on interventions -- actions or events which influence individuals in their use of an innovation. The focus of the paper is on an eclectic methodology, used in the PTI study, which was developed through experience gained with procedures employed in earlier studies. Strengths and weaknesses of procedures employed in these preliminary studies, as well as those employed in the PTI study, were discussed.

One can conclude that a technique which combines several procedures as well as several perspectives, as does the technique used in the PTI study, is an effective means of capturing the events and actions which influence the implementation of an innovation. A methodology which employs several self-report techniques and several informants can be almost as effective in

developing the total picture as ethnographic methodologies which are considerably more expensive. The hybrid approach can also circumvent many of the problems associated with more limited self-report methodologies, such as the tendency of the subject to present him/herself in a positive light.

Data collected in this way is highly descriptive, yet focused. This allows the researcher to analyze the data both quantitatively (Hord and Hall, 1982) and qualitatively (Stiegelbauer, Goldstein & Huling, 1982) without an inordinate amount of reformulation. The techniques also provided the opportunity to collect rich contextual data which will serve to complement the intervention data and fill out the total picture of implementation (Griffin & Hall, 1982). The three other papers that compose this symposium will describe these qualitative and quantitative techniques for analysis of interventions and context which are being performed on the PTI Study data (Hord and Hall, 1982; Stiegelbauer, Goldstein & Huling, 1982; Hall & Griffin, 1982).

The study of interventions is an important pursuit. In order to understand the process of change in schools, one must explore what significant individuals do to make change occur. Before one can train people such as school principals, to be more effective leaders one must understand what effective leaders do to bring about beneficial changes. If one aims to determine if certain school programs are effective, it is important to look not only at effects and at use of the program, but also at events and actions which occur that potentially influence outcomes. To accomplish these tasks it is necessary to develop effective and efficient methods for studying what people do, the interventions they make, to influence school change efforts.

The methods employed for the PTI study were both effective and efficient in accomplishing the goals of the study. Similar methods could well be

employed in future studies of school change, as well as in other studies which focus upon individual behaviors within organizational settings.

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